

WHAT IS CLAIMED IS:

1	A method for inspecting electronic components mounted on a
2	printed circuit board with a mounting substance, each of the components including
3	leads, endcaps or other interconnects, the method comprising:
4	imaging the components and the mounting substance on the printed
5	circuit board to obtain 3-D and 2-D data associated with the components and material
6	surrounding the components; and
7	processing the 3-D and 2-D data in combination to find the locations
8	of the components based on identified leads, endcaps, or other attributes as
. 9	differentiated from the mounting substance, circuit board and other material on which
10	the components are placed.
1	2. The method as claimed in claim 1 wherein the mounting
2	substance is solder paste.
2	substance is solder paste.
1	3. The method as claimed in claim 1 wherein the mounting
2	substance is an adhesive.
_	substance is an admestive.
1	4. The method as claimed in claim 3 wherein the adhesive is a
2	glue.
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1	5. The method as claimed in claim 1 wherein the leads have feet
2	and wherein the step of processing includes the step of calculating centroids of the
3	feet.
1	6. The method as claimed in claim 1 wherein the leads have feet
2	and wherein the step of processing includes the step of calculating average height of
3	the feet.
1	7. The method as claimed in claim 1 wherein the step of
2	processing includes the step of calculating border violation percentage of the
3	mounting substance.
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1	8. The method as claimed in claim 1 wherein the step of
2	processing includes the step of pruning the board.
1	9. The method as claimed in claim 1 wherein the step of
2	processing includes the step of pruning the leads from the mounting substance.
1	10. The method as claimed in claim 1 wherein the step of
2	processing includes the step of processing the 3-D data together with upper and lower
3	threshold values to find the locations of the leads and the mounting substance.
1	11. A system for inspecting electronic components mounted on a
2	printed circuit board with a mounting substance, each of the components including
3	leads, endcaps or other interconnects, the system comprising:
4	a 3-D scanner for imaging the components and the mounting substance
5	on the printed circuit board to obtain 3-D and 2-D data associated with the
6	components and material surrounding the components; and
7	a high-speed image processor for processing the 3-D data to find the
8	locations of the leads and the mounting substance and for processing the 2-D data
9	together with the locations of the leads and the mounting substance to distinguish the
10	leads from the mounting substance.
1	12. The system as claimed in claim 11 wherein the mounting
2	substance is solder paste.
1	13. The system as claimed in claim 11 wherein the mounting
2	substance is an adhesive.
1	14. The system as claimed in claim 13 wherein the adhesive is a
2	glue.
1	15. The system as claimed in claim 11 wherein the leads have feet
2	and wherein the high speed image processor also calculates centroids of the feet.

1	16. The system as claimed in claim 11 wherein the leads have feet
2	and wherein the high speed image processor also calculates average height of the
3	feet.
1	17. The system as claimed in claim 11 wherein the high speed
2	image processor also calculates border violation percentage of the mounting
3	substance.
1	18. The system as claimed in claim 11 wherein the high speed
2	image processor also prunes the board.
1	19. The system as claimed in claim 11 wherein the high speed
2	image processor also prunes the leads from the mounting substance.
1	20. The system as claimed in claim 11 wherein the high speed
2	image processor processes the 3-D data with the upper and lower threshold values
3	to find the locations of the leads and the mounting substance.
1	21. A method for inspecting electronic components mounted on a
2	printed circuit board with a mounting substance, each of the components including
3	a body and endcaps, the method compfising:
4	imaging the components and material surrounding the components to
5	obtain 3-D and 2-D;
6	processing the 2-D and 3-D data to find locations of the endcaps; and
7	further processing with the 2-D data to isolate the endcaps from their
8	bodies.